

WHAT IS CLAIMED IS:

1. A thin film magnetic memory device comprising:
a plurality of magnetic memory cells permitting random accesses;
and
a program element storing information in a fixed manner; wherein
5 each of said plurality of magnetic memory cells includes a conductive
magnetic film formed of a plurality of layers,
said program element includes a link portion electrically connected
between first and second nodes and fusible by an external input, and
said link portion is configured with the same layer as at least one of
10 said plurality of layers constituting said conductive magnetic film.

2. The thin film magnetic memory device according to claim 1,
wherein
said conductive magnetic film includes
a first layer forming a magneto-resistance element having a
5 magnetic tunnel junction,
a second layer forming a via contact for connecting said magneto-
resistance element to another interconnection, and
a third layer forming a lead interconnection for connecting said
magneto-resistance element to another interconnection, and
10 said link portion has the same layer as said first layer.

3. The thin film magnetic memory device according to claim 1,
wherein
said conductive magnetic film includes
a first layer forming a magneto-resistance element having a
5 magnetic tunnel junction,
a second layer forming a via contact for connecting said magneto-
resistance element to another interconnection, and
a third layer forming a lead interconnection for connecting said
magneto-resistance element to another interconnection, and

10 said link portion has the same layer as said third layer.

4. The thin film magnetic memory device according to claim 1,
wherein an electrical contact structure between respective one of said first
and second nodes and said link portion is identical to an electrical contact
structure between another node provided in the same interconnection layer
5 as respective one of said first and second nodes and each said magnetic
memory cell.

5. The thin film magnetic memory device according to claim 4,
wherein
said conductive magnetic film includes
a first layer forming a magneto-resistance element having a
5 magnetic tunnel junction,
a second layer forming a via contact for connecting said magneto-
resistance element to another interconnection, and
a third layer forming a lead interconnection for connecting said
magneto-resistance element to another interconnection, and
10 said electrical contact structure between respective one of said first
and second nodes and said link portion has the same layer as said first layer.

6. The thin film magnetic memory device according to claim 1,
wherein said link portion can be blown by external laser irradiation.

7. A thin film magnetic memory device comprising:
a plurality of magnetic memory cells permitting random accesses;
and
a program circuit storing information in a fixed manner; wherein
5 each of said plurality of magnetic memory cells includes a tunneling
magneto-resistance element formed of a plurality of layers including a
conductive magnetic film and an insulating film and having a resistance
changed in accordance with magnetically written data,
said program circuit includes

10 a first program element connected between first and second nodes,
and formed of said plurality of layers as with said tunneling magneto-
resistance element,
 an amplifier portion reading said information in accordance with a
resistance between said first and second nodes, and
15 a first breakdown voltage apply portion applying a first voltage
stress capable of causing breakdown of said insulating film in said plurality
of layers constituting said first program element, between said first and
second nodes as appropriate,
 an upper layer side and a lower layer side of said plurality of layers
20 constituting said first program element are electrically connected to one and
the other of said first and second nodes, and
 said first program element is shaped such that at least a portion of
its portion electrically connected between said first and second nodes is
fusible with a first external input.

8. The thin film magnetic memory device according to claim 7,
wherein

 said first external input is laser irradiation applicable before a
packaging step of said thin film magnetic memory device, and

5 said first voltage stress is applied after said packaging step of said
thin film magnetic memory device.

9. The thin film magnetic memory device according to claim 7,
wherein

 said program circuit further includes

 a second program element connected between a third node and said
5 second node and formed of said plurality of layers as with said tunneling
magneto-resistance element, and

 a second breakdown voltage apply portion applying a second voltage
stress capable of causing breakdown of said insulating film in said plurality
of layers constituting said second program element, between said second and
10 third nodes as appropriate,

an upper layer side and a lower layer side of said plurality of layers constituting said second program element are electrically connected to one and the other of said second and third nodes,

15 said second program element is shaped such that at least a portion of its portion electrically connected between said second and third nodes is fusible with a second external input, and

 said amplifier portion reads said information in accordance with comparison of the resistance between said first and second nodes with a resistance between said second and third nodes.

10. The thin film magnetic memory device according to claim 9, wherein

 each of said first and second external inputs is laser irradiation applicable before a packaging step of said thin film magnetic memory device,
5 and

 each of said first and second voltage stresses for breaking said insulating film is applied after said packaging step of said thin film magnetic memory device.

11. A thin film magnetic memory device comprising:

 a plurality of magnetic memory cells permitting random accesses;

and

 a program circuit storing information in a fixed manner; wherein

5 each of said plurality of magnetic memory cells includes a tunneling magneto-resistance element formed of a plurality of layers including a conductive magnetic film and an insulating film and having a resistance changed in accordance with magnetically written data,

 said program circuit includes

10 a first program element formed of said plurality of layers as with said tunneling magneto-resistance element,

 a first program interconnection electrically connected to said first program element and a first node,

 a first current driving portion for supplying said first program

15 interconnection with a current for magnetically writing data to said first
program element, and
an amplifier portion reading said information in accordance with a
resistance between said first and second nodes,
an upper layer side and a lower layer side of said plurality of layers
20 constituting said first program element are electrically connected to one and
the other of said first program interconnection and said second node, and
said first program interconnection is shaped such that at least a
portion of its portion electrically connected between said first program
element and said first node is fusible by a first external input.

12. The thin film magnetic memory device according to claim 11,
wherein said first external input includes external laser irradiation.

13. The thin film magnetic memory device according to claim 11,
wherein
said program circuit further includes
a second program element formed of said plurality of layers as with
5 said tunneling magneto-resistance element,
a second program interconnection electrically connected to said
second program element and a third node, and
a second current driving portion for supplying said second program
interconnection with a current for magnetically writing data to said second
10 program element,
an upper layer side and a lower layer side of said plurality of layers
constituting said second program element are electrically connected to one
and the other of said second program interconnection and said second node,
said second program interconnection is shaped such that at least a
15 portion of its portion electrically connected between said second program
element and said third node is fusible with a second external input, and
said amplifier portion reads said information in accordance with
comparison of the resistance between said first and second nodes with a
resistance between said second and third nodes.

14. The thin film magnetic memory device according to claim (13), wherein each of said first and second external inputs includes external laser irradiation.